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OFF-ROAD VEHICLE MONITORING
PLANS: A PROPOSAL FOR THE
BUREAU OF LAND MANAGEMENT

MARCH 1980

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INTRODUCTION

By congressional mandate and Presidential Executive Order, the Bureau of Land Management (BLM) is required to monitor the effects of off-road vehicle (ORV) use on the public lands.

Resource monitoring, including the effects from ORV use, is an important consideration by reference in the following documents:

- (1) Presidential Executive Order 11644 as amended by EO 11989.
- (2) The Federal Land Policy and Management Act of 1976.
- (3) Management of ORV Use on Public Lands - 43 CFR Part 8340.
- (4) Public Lands and Resources; Planning System - 43 CFR Part 1600
- (5) National Environmental Policy Act

By definition in BLM's ORV Regulations (43 CFR Part 8340), commercial, administrative, emergency, fire, and law enforcement vehicles are not classified as off-road vehicles. However, it is necessary to recognize that any vehicle operated off-road has the potential to disturb the environment, create user conflicts, and can represent a hazard to the operator and/or others. For this reason, efforts to monitor vehicle use have to consider all vehicles, regardless

of their reason for being off-road on public land. Commercial and administrative off-road use is normally much easier to identify and regulate than recreational off-road use.

The use of emergency, fire, or military vehicles in most cases will be short-term, and efforts to rehabilitate damage can be undertaken immediately without conflict from continuing use. There could be exceptions where such use may occur on a continuing basis, or the trail created by passage of these vehicles may be utilized for future traffic and no rehabilitation is necessary, i.e., a fire-break used as a motorcycle trail.

In order to comply with the intent of Congress and the Presidential Executive Orders, monitoring plans must be prepared to meet the following objectives:

- (1) Determine if resource (natural, visual, or cultural) damage is occurring from the operation of vehicles off-road, and the extent of any damage.
- (2) Identify safety hazards to vehicle operators and other public land users. Steps must be taken to eliminate or neutralize hazards that are an unacceptable element in the activity.

(3) Identify conflicts between other recreation users, including other motorized vehicle users and other public land users in order to resolve the conflicts.

(4) Determine if adequate ORV recreation opportunities are being supplied to meet demand. This may also involve efforts to regulate use levels on an area to improve the quality of experiences being provided.

(5) Evaluate the ORV designation assigned to areas/trails as required by BLM's regulations to determine if it is appropriate and recommend modification if necessary.

(6) Assure compliance with the standards for vehicle operations on public lands (43 CFR subpart 8343).

(7) Evaluate the success of any rehabilitation efforts specified in ORV recreation use permits or mitigation measures identified in the implementation plans. Mitigation may be required to offset impacts from actions to carry out designations.

(8) Identify the specific type of vehicle causing problems (resource damage, user conflict, safety hazard) to assure that vehicle restrictions are designed for the "target" group, and do not generalize against those types of vehicles not responsible for problems.

(9) Assure that there is compliance with the area/trail designation of "open," "closed," or "limited" use.

(10) Assure that authorized vehicle use complies with the intent of BLM's off-road vehicle regulations.

The BLM will utilize three basic types of ORV designations:

(1) Temporary, i.e., fire or avalanche hazards.

(2) Interim - for use during the period prior to identification through the Bureau planning system (normally used for a critical situation).

(3) Standard - identified through the Bureau planning system.

Monitoring plans should be developed for each of these designations.

All BLM lands will eventually be classified through the standard designation process as being either "open," "closed," or "limited." The temporary and interim designations will use these same three classes.

Monitoring will be used to determine if the broad area classifications are correct. It will also be necessary to monitor specific on-site conditions within these broad areas to measure the effects of vehicles where use is concentrated, occurs on trails or in open areas which involve cross-country travel.

BLM administers land from the arctic tip of Alaska to deserts in the southwest and swamplands in the southeast. These lands encompass a wide range of environments, from below sea level to over 21,000 feet in elevation, with terrain features from swamps to desert and with use ranging from high density to highly dispersed.

Because of these extreme variations in environments and the degrees of potential user conflicts, no single monitoring system or intensity of monitoring is warranted or practical. Each area or trail system will have a monitoring system crafted for it. The type of system would cover a large area or be site-specific based on the quality or sensitivity of the resource and estimated levels of vehicle use.

It appears that the closer an area or trail is to a population center, the greater the need for monitoring. In these areas, use will normally be greater, as will the sensitivity of the public to any resource modifications. Isolated, lightly used areas or trails will not require sophisticated monitoring to measure resource damage or the areas/trails success in meeting recreation demand. However, the need to identify and correct safety hazards in isolated areas will be an important consideration regardless of use levels.

Although the exact proportion is not known, the majority of vehicle operations occur on some sort of established trail, path, or way. Therefore, most ORV monitoring will involve trails. Exceptions to this statement will be those vehicles operated in open play areas (limited in number) and cross-country travel associated with competitive racing.

PURPOSE

The purpose of this proposal is to develop a discussion paper on how and when BLM should prepare plans to monitor off-road vehicles. This paper will be circulated throughout the BLM for review and comment. From this foundation, specific guidelines for monitoring ORV use can be developed for incorporation into the BLM's manual on off-road vehicle management and designation.

This paper will discuss the current ORV situation in BLM, the relationship of monitoring to the BLM planning system, and the use of monitoring to assure compliance with special conditions in ORV recreation use permits and authorizations for commercial vehicles to operate against BLM ORV designations.

Key factors to be considered in locating open-use areas and trails will be listed. These same key factors will be important points to be considered in developing a monitoring system.

This paper will identify some specific needs for methodology and development standards for use in BLM's overall ORV management program. It is not the intent of this paper to assess the desirability or need for BLM to provide ORV recreation opportunities or in allowing vehicles to be used for commercial or administrative purposes on the public lands. ORV use for these purposes is fully supported by the documents listed in the introduction as well as in other Federal laws and BLM policy.

INVESTIGATIONS

This paper was developed through a review of pertinent research, discussions with various resource specialists, and through contacts with interest group representatives.

There has been considerable research on the impacts of off-road vehicles on various environments, primarily motorcycles in the southwest and snowmobiles in the Lake States region. To date, there has been limited effort to establish uniform systems for monitoring ORV use. Region 1 of the U. S. Forest Service, using Dr. Steve McCool from the University of Montana on I.P.A. assignment, has developed a draft proposal on ORV monitoring plans. The BLM should use Dr. McCool's work as a point of departure for developing a monitoring plan concept.

Most research on ORV impacts has been done in "open-use" areas. The research that exists relative to resource impacts associated with trail use is limited mostly to horse and hiking. Much of this research may also apply to trail use by motorized vehicles. Although most research on motorcycles in open areas and snowmobiles has been done in isolated parts of the country, the methodologies to measure impacts can probably be used in other areas as well.

As is the case with controversial activities such as off-road vehicles, there is an obvious polarization between interests--not only about the use of vehicles but also about how the use should be monitored. This polarization appears to carry over into the scientific community as well. There is a distinct lack of enthusiasm among non-ORVer's for recognizing off-road vehicles as a legitimate public land use. These same feelings also exist inside the BLM.

In the areas of ORV resource damage, user conflicts, and safety, certain quantifiable limits of tolerance need to be established if ORV's are to be accepted as a legitimate use. Realistically, almost any wildland activity will have some affect on natural resources. Also, because of the nature of the off-road vehicle activity and the independence of many proponents, a certain degree of risk is accepted. Because of the associated risk and challenge, there are bound to be safety hazards and conflicts with other users.

With regard to resource damage, user conflicts, and safety, many ORV critics feel that the tolerable limit in each of these categories is zero. In other word, many non-ORVer's feel that no resource damage should be tolerated; any conflicts between users should be resolved favoring the non-ORV user, and no activity should be allowed on public lands that is dangerous to the participant or to anyone else.

Initially, BLM's ORV designations and efforts to manage use will be built around existing transportation routes and facilities that were developed for use by other forms of recreation. Trails and low-standard roads exist as a result of livestock and game movement, for access to range improvements and those developed for timber harvest or for mining purposes. Very few trails, except the ones which evolved by continuous passage of recreation vehicles, have been designed or developed to accommodate ORV use.

Based on experience gained from other resource management programs such as range, wildlife, watershed, timber, etc., monitoring systems are currently available to measure change or modifications to the basic resources of soil, vegetation, wildlife habitat, water, air, and aesthetics. These monitoring systems can be adapted to measure resource damage caused by off-road vehicles.

Monitoring resource modifications can be as simple as comparing photographs (low elevation aerial photos, high altitude, or close-up photo points) taken over time to the establishment of sophisticated transects to calibrate the amount of vegetative removal, soil movement, soil compaction, etc. These elements of the environment are fairly easily monitored, and the results can be quantified.

It is the other elements of concern--user conflicts, safety hazards, and user satisfaction with recreation opportunities--that are much more difficult to assess. Any of the above elements can be documented simply by on-site observations or through comment from those familiar with a specific area or trail.

But to evaluate the intricacies of user conflict, whether it be to explore the affects the presence vehicles has on a person's solitude or how noise impacts users, requires much more sophisticated methodology than merely observation. This is where our traditional natural resource orientation falls short, since conflict resolution requires knowledge in social sciences.

Again, concerns at the beginning of our monitoring efforts will be more prevalent since user patterns have become established through unrestricted use and are not the result of planning for off-road vehicle use. As more experience is gained with ORV impacts, facilities and areas to accommodate concentrated trail use can be located to minimize resource damage, user conflict, and safety hazards.

DISCUSSION

Current situation:

As mentioned, most facilities (including trails) and existing ORV use patterns on public lands have resulted from past use with minimal management direction. For this reason, the type and extent of resource

damage, user conflicts, safety problems, etc., will initially be in direct proportion to the lack of planning, design development, and management to accommodate off-road vehicles. Also, the state of the art in planning for all types of off-road vehicle activities is in the early stages of evolution.

ORV use on public lands will go through a lengthy period of adjustment primarily by trial and error until an acceptable balance between use and natural resources in a variety of environments can be attained. Hopefully, with experience in managing ORV's and advances in the design arts which establish standards appropriate to both the users and the environment, the capability to manage vehicles will be better founded than it is now. Success will also depend on a change in personal attitude on the part of many and a commitment by management to expend funds to improve conditions.

In considering the location of trails desired by motorcyclists and four-wheel drive operators, it is immediately evident that the standards desired by operators seeking to challenge them and their vehicles are in direct conflict with other concerns to maintain a natural, stable environment.

Each of the three classes of ORV designations represents different situations that need to be monitored. These situations by class of designation are:

Open areas: **Cross-country travel**

User concentration

Restricted: **Seasonal**

(Limited) **Established trail**

Vehicle type

Closed: **Use by "authorized" vehicles**

Violation of closure by "unauthorized" users

There are also three different types of specialized vehicles to be monitored: trail bikes/motorcycles, four-wheel drive vehicles, and snowmobiles. Since there are significant differences associated with the operation of each vehicle type, distinctions should be made in implementing actions to regulate use by the different vehicle types.

Also, non-specialized vehicles are used off-road. These vehicles are referenced in the BLM's ORV regulations definition section as ". . . any motorized vehicle capable of . . . travel on or immediately over water or other natural terrain." This use must be considered as a separate vehicle type in developing area/trail designations or management actions. Actually, non-specialized vehicles have the reputation of being more damaging to the environment, can cause more serious user conflicts, and can be much more hazardous than specialized vehicles.

Obviously whether it be a specialized or non-specialized vehicle, the operator is the impact causing agent, not the vehicle itself.

Commercial and administrative use of vehicles is normally more easily monitored and regulated on public land than is recreational use. And the recreational use issue is further complicated by the fact that many people do not feel that their use of vehicles off-road in conjunction with other recreation activities (hunting, fishing, rockhounding) is actually ORV use. To them, only those activities which utilize the bike or four-wheel drive vehicle as the recreation in and of itself qualifies as ORV use. It may seem like a minor issue, but as a result of this attitude, management efforts can be more difficult to impose.

Until everyone operating a vehicle is willing to accept that all vehicles operated off-road on a trail or cross-country are capable of producing the same impacts regardless of the purpose behind vehicle operation, the job of correcting problems will be more difficult.

Relationship to the Bureau's Planning System (see Table 1)

Resource allocation decisions and recommended actions to meet management objectives for resource areas are developed through the Bureau's planning system. The Bureau planning system (EPS) will be

Table J. Data Flow - Inventory Phase Through Monitoring Plan in the Existing and New BLM Planning System

ORV Design in Present Planning System	Planning Process	ORV Designation in New Planning System	ORV Relationship
Inventory URA Step 1	Data collection all resources. Prepare base map. Develop physical profile.	Inventory data and information collection 1601.5-3.	Collect resources, environmental, social, economic, and institutional data relevant to the planning area and the operation of ORV's.
URA Step 3	Analysis of present situation and identification of management appropriations.	Analysis of management situation 1601.5-4.	Analyze the present situation, identify ORV recreation opportunities and management restrictions by resource activity.
MFP Step 1	Activity objectives and recommendations.		Maximize resource activity opportunities including actions to promote and/or restrict ORV use.
	Prepare a set of reasonable resource management alternatives.	Formulation of alternatives 1601.5-5.	Consider feasible options for ORV designations to meet objectives for each alternative.
MFP Step 2	A multiple-use analysis.		Proposed best mix of resource allocation to meet selected management objectives--include proposed ORV designations and identify "tolerable limits" from ORV activities.
	Develop a preferred alternative.	Selection of preferred alternative 1601.5-7.	The selected alternative should include a proposed ORV designation which best meets national and State Director guidance; include "threshold levels" for disturbance from ORV use.
Environmental Impact Statement & major environmental assessments	Analysis of impacts of vegetative resource allocation and forest management.		The present EIS process does not consider the impacts of ORV use, except as such use may effect grazing or the production of forest products.
	Analysis of draft resource management plan with selected alternative as proposed action.	Environmental impact statement policy 1601.0-6 and selection of preferred alternative 1601.5-7.	Analysis of environmental impacts of proposed ORV designations and identification of mitigation measures.
MFP Step 3	Final planning decision.	Selection of resource management plan 1601.5-8.	Utilizing MFP 2 and EIS (existing system), the draft RMP/EIS (new system), the final management plan is developed. Includes the ORV designations and the tolerable limits or threshold levels for ORV use.
ORV Implementation Plan	Detail specifics of ORV designations and any on-the-ground actions necessary to implement the designations.	Conformity and implementation 1601.6-2.	Define and document the action required to implement ORV designations.
Environmental Assessment	Evaluate specific on-the-ground actions related to implementing ORV designations.	Environmental assessment.	Discuss the environmental implication of ORV designations (existing system) and actions necessary to implement the designation (both systems); identify mitigation.
Monitoring Plan	Evaluate MFP's or RMP's for meeting ORV management objectives and measure effects resulting from implementation plan.	Monitoring and evaluation 1601.5-9.	Objectives of plan relative to ORV's: (1) determine appropriateness of ORV designations; (2) adherence to tolerance limits (MFP) and threshold levels (RMP); (3) compliance with ORV designations; (4) compliance with mitigation in EIS and environmental assessments.

followed in making standard designations. Normally, temporary and interim designations will be made outside the planning system process. However, both temporary or interim designations could be used in areas covered by a completed management plan when circumstances change or conditions develop warranting their use.

A standard set of ORV designations involving every acre in each resource area will be a product of Step 3 Management Framework Plan, and eventually the designations will be included in a Resource Management Plan (new Bureau planning regulations, 43 CFR Part 1600). The first RMP's are scheduled for completion in FY 1983.

Prior to making the actual ORV designation, whether it is standard, interim, or temporary, an implementation plan will be prepared to detail specifics of the designation and how the designation will be put into effect.

The implications of this plan on the resources, users (motorized and non-motorized) safety, and in providing ORV recreation opportunities will be analyzed through an environmental assessment. Mitigation necessary to off-set negative impacts of the designation will be identified through the assessment process. Implementation of the designation may include actions which require mitigation to minimize impacts to the environment.

During the period of transition from the old to the new planning regulations, an implementation plan, environmental assessment, and monitoring plan will be prepared before making the final designation. The Resource Management Plan, including the ORV designations made in the future using the new planning regulations, will be analyzed through the environmental impact statement process per 43 CFR 1601.0-6.

Upon approval of the RMP (43 CFR 1601.6-1), it will be necessary to follow the same sequence of documentation as required with an MFP, implementation plan, environmental assessment of the plan, and a monitoring plan prior to making the final ORV designation.

The objectives of a monitoring plan will be to accomplish the following:

(1) For compliance with 43 CFR part 1601.5-9, Public Lands and Resources; Planning System, which requires monitoring to determine whether effects (in this case ORV designations) projected for the approved plan (MFP or RMP) were correct and whether there is a sufficient divergence from anticipated effects or sufficient new data to warrant amendment or revision of the plan (especially modification of ORV designation).

(2) Provide the basis for evaluating the success of specific actions identified in the implementation plan and the mitigation measures

identified in the environmental assessment or environmental impact statement. The monitoring system should identify when ORV use (commercial, recreation, or administrative) is causing problems that exceed "tolerable limits" (MFP) or "threshold levels" (RMP) established for resource use. It should also identify any specific mitigation needed to off-set impacts created by actions to carry out designations, i.e., installing barriers, building fences, etc.

Monitoring Authorized ORV Use

In addition to monitoring ORV activities in the formal designation process, monitoring plans should be required to cover ORV use authorized through issuance of recreation-use permits and those commercial uses authorized by leases, licenses, or contracts.

A monitoring plan should be required as part of an environmental assessment prepared prior to issuance of ORV recreation-use permits for competitive and commercial events. The monitoring plan would outline the procedures to evaluate for compliance with special conditions of the recreation-use permits and any mitigation identified.

The BLM's ORV regulations exempt certain commercial authorized vehicles from the conditions of use by definition.

Authorization to operate commercial vehicles off-road against a

particular designation will be in the form of lease or license (grazing), lease (oil and gas, geothermal exploration), contract (timber sale), etc. Although authorized, these uses of off-road vehicles should be monitored to measure resource effects or user conflicts.

Authorizations should include specific conditions for the operation of vehicles against an ORV limitation or closure. An ORV monitoring plan should be made part of each document authorizing commercial off-road vehicle use.

Key Factors for Evaluating Open-Use Areas and Trail Locations

Open-use areas - These are areas where vehicles will be allowed to operate cross-country off an established trail and those areas identified to concentrate vehicle use (noise park, play area, competitive area, impact area, etc.).

The factors listed below should be considered in evaluating an area for an "open" designation. Some of these same factors are also important in identifying limitations. These factors can serve as a basis for determining the intensity of monitoring and the type of system adequate to identify resource damage, user conflicts, safety hazards, and adequacy of the area in meeting recreation ORV opportunity needs.

Obviously, where resources are fragile and the allowance of off-road vehicles represents a marginal situation, the potential and urgency for measuring resource damage will be more critical. Monitoring

will have to be more intense to keep degradation within established tolerances. The timing will be critical in recognizing problems so prompt action can be taken to avoid irreversible damage.

The importance of each key factor will be site specific, and wide variations in importance between factors are expected depending on area location.

Key factors are:

- (1) Climate - Especially, precipitation amounts and length of growing season as related to potential for site rehabilitation.
- (2) Slope and aspect potential for erosion and variety of gradients reflecting the degree of rider difficulty presented.
- (3) Vegetation - Vulnerability to damage or removal and as possible barrier to cross-country travel.
- (4) Drainage - Mainly live streams or other water bodies and their susceptibility to water quality degradation.
- (5) Soils - Erodibility and reseeding capability.
- (6) Use Levels - Normally a function of proximity to population centers or destination recreation areas.
- (7) Ownership Patterns - This factor may limit areas, size of usable area, and could affect the success of efforts at rehabilitation on public lands.

The following table compares the key factors to the various elements of concern expressed in this paper:

Table 2 - Relationship of Key Factors to Elements of Concern:

Key Factor	Elements of Concern				
	Resource Damage	User Conflicts	ORV Rec. Safety	Opportunity	Rehabilitation
Climate	x			x	x
Slope	x	x	x	x 2/	x
Vegetation	x	x	x	x 3/	x
Drainage	x	x 1/			x
Soils	x	x		x 4/	x
Use Levels	x	x	x	x	x 5/
Land Ownership		x		x	x 6/

1/ Fishing and other water-based recreation opportunities.

2/ Positive value - variety of ORV opportunity negative; steepness may prohibit cross-country travel.

3/ Cross-country travel restrictions.

4/ Sand dunes.

5/ Pressure to use area may effect efforts to rehabilitate.

6/ Presence of private land can affect access, represent conflicts with land owners, and influence rehabilitation efforts on public lands.

Trail Locations - Many trails or low-standard roads that exist on public land developed through the movement of animals or were built to minimum standards for access to range improvements, or skid trails for logging or, to a lesser extent, were built during fire prevention and suppression activities.

In recent years, many new trails have evolved by the passage of vehicles cross-country during the course of recreational activities and public land administration. The trails created by animals and for access to range improvements are less susceptible to resource damage and represent less of a safety hazard because gradients are normally not excessive.

Trails and four-wheel drive roads created by vehicle operators trying to challenge their riding/driving skill and vehicle performance will be more prone to resource damage, user conflict, and safety hazards. But these trails will be acceptable to those off-road operators seeking a challenge activity.

Realistically, any vehicle travelling on or off-trail will disturb soil and vegetation. The severity of the disturbance will depend on the basic resource, skill of the vehicle operator, design of the vehicle (specialized versus non-specialized), and the total amount of use over time.

Key factors to be considered in locating trails and monitoring trail use are listed below. All these factors have some effect on trail erosion, but, according to research, the first three factors appear to be the most critical:

1. Vegetative habitat as an expression of moisture and soil-related factors.
2. Land form.
3. Slope of trail and length of grade.
4. Parent soil material and soil properties.
5. Climate.
6. Location of water table.
7. Slope aspect.
8. Level of trail use.
9. Trail elevation.

Limitations, Methodology, and Standards

In order to implement an ORV monitoring system for the various elements discussed in this paper, the BLM will have to adopt appropriate methodologies and standards for vehicle operation and resource disturbance. A few items that have been identified as being needed are listed below.

Standards

- (1) In order to measure the impact of vehicles on aesthetic values and identify user conflicts, acceptable noise levels are needed for off-highway vehicle use.
- (2) A range of standards for beginner, intermediate, and expert motorcycle trails.
- (3) A general standard for a low-class, challenging four-wheel drive trail.
- (4) Tolerance limits (MFP) or threshold levels (RMP) for resources specifically related to the operation of off-road vehicles.

Methodology

- (1) Appropriate methods for measuring ORV-created safety hazards, hazards to ORV operations, and user satisfaction with ORV opportunities.
- (2) Criteria for determining the need for monitoring ORV use and to identify the required level of monitoring for a particular area or trail system.

(3) Identify the relationship of monitoring in the Bureau planning system, the use of monitoring to assure compliance with the ORV designation implementation plan and how monitoring will be used to assure compliance with special conditions of recreation use permits.

(4) Identification of area (site) and trail maintenance and rehabilitation techniques appropriate to ORV use.

CONCLUSIONS

In order to comply with legislation and Presidential Executive Orders, the BLM will be making interim, temporary, and standard ORV designations. Recreation use permits will be granted to authorize ORV recreation commercial and competitive events. Commercial ORV vehicle use will be authorized by license, lease, and contract.

To assure that all these activities are systematically regulated and the impacts are quantified, some type of monitoring plan will be required for all ORV activities. These plans should be made a part of the implementation plans which precede each designation action and are included in the permit authorizing special uses.

The existing planning manual and the manual developed to implement the new planning regulations should specifically address the ORV designation as an end product of the planning process.

In Step 1 of the Management Framework Plan and the resource management situation analysis, the appropriate resource activities should recommend actions to accommodate ORV use (primarily recreation) and to restrict ORV use (all activities including recreation) to protect resource values. In Step 2 of the Management Framework Plan (RMP-development of alternatives and selection of a preferred alternative), ORV designations should be proposed and standards (threshold levels-RMP) should be recommended for air quality, water quality, aesthetics, soil loss, vegetative removal, etc., related to the use of vehicles off-road. In Step 3 of the MFP (Final RMP), the ORV designation and tolerance limits or threshold levels should be finalized.

The final designations and standards for tolerance limits (MFP) and threshold levels (RMP) would be the basis for developing a monitoring plan to meet objectives listed in the Introduction (refer to Table 1 Data Flow - Inventory Phase Through Monitoring Plan in the Existing and New Planning Systems).

BLM's Headquarters office should establish task force assignments to develop the necessary methodology and establish the standards identified in the Limitations, Methodology, and Standards, section of this paper.

Because of the scheduled completion date for ORV designations Bureau-wide (mid-1980's), it is urgent that these recommendations receive immediate attention.

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